

## Otitis media referrals - the general practitioner perspective

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### Abstract

**Objective:** Otitis media (OM) management involves both primary and specialist health care. The present study used data on general practitioner (GP) referrals to estimate the proportion of children with OM referred from primary to specialist care, study variation in referral pattern and factors that influence GP behaviour.

**Methods:** Data on GPs' view on collaborative aspects of specialist health care was collected in a cross-sectional questionnaire survey among all Norwegian GPs in 2004 (N=1633). The outcome of interest was referral routines for OM at first visit and at follow-up.

**Results:** Mean referral for OM was 22%, most commonly at follow-up visit. 27% of children with OM were sent to ear, nose and throat (ENT) departments and 73% to practicing otolaryngologists. Variation in referral pattern among GPs was moderate. GPs with specialty in general medicine had 6% fewer referrals. Separate analysis on referral to practicing otolaryngologists showed that GP work load and availability to practicing specialists increased referral, whereas availability to hospital services reduced the probability.

**Conclusion:** In Norway, OM management mainly takes place in primary care. Completed specialty in general medicine reduces referrals. We suggest that learning groups may contribute to update knowledge in primary care and fewer referrals to specialists. Also, non-medical factors seem to influence referral behavior in general practice.

## Introduction

Otitis media (OM) is generally a common childhood infection <sup>1</sup>, a frequent reason to visit a general practicing doctor (GP) <sup>2</sup> and an important cause of antibiotic use in children <sup>3</sup>. Overall management of OM involves both GPs and specialist health care to identify patients requiring surgical management and those with hearing deficits or prolonged or recurrent infections <sup>4,5</sup>.

Despite a suggested <sup>6,7</sup>, but not unequivocal <sup>8</sup>, incidence increase of OM, an overall reduction in GP consultation rates for OM is reported in a Dutch study <sup>9</sup>, confirming earlier reports <sup>8,10</sup>. The same study found increased referrals for otitis media with effusion (OME), and questioned if the explanation is a change in consultation threshold due to a patient delay in GP contact until symptom presentations clearly warrant referral to specialist care.

In addition to patient and GP behaviour, non-medical factors such as availability to primary and specialist health care may influence referrals. Also, various strategies for guideline implementation <sup>11</sup> may affect GPs and contribute to changed referral patterns. Both GPs and otolaryngologists have contributed to the present clinical guidelines on antibiotic treatment and referrals for OM in primary care from the Norwegian Board of Health <sup>12</sup>. With cross-sectional data on collaborative aspects and GP routines for referral to specialist health care, our aim was to describe OM referral attitudes from the view of primary care, estimate practice variation among GPs and study factors that influence their behavior.

## Methods

In Norway, primary care is mainly publicly provided, and as of 2001 all inhabitants have the right to sign onto the list of the GP of their choice <sup>13,14</sup>. Referral to specialist health care is conducted by the physician based on medical reasons. Ear, nose and throat (ENT) services are provided both by public hospitals and by practicing specialists who have a contract with the public sector. ENT surgery is mainly provided by hospitals. When referral to otolaryngologist is needed, the GP acts as a gatekeeper and makes an appointment for the patient with a practicing otolaryngologist or an ENT department. This system is uniform throughout the country.

The study population included all Norwegian GPs registered in the database of the Norwegian Medical Association. A total number of 3388 physicians received in 2004 a postal questionnaire about their view on collaborative aspects of specialist health care, including

specific questions on referral routines for the otolaryngologic diseases OM, hay fever, dizziness and sleep apnea. The response rate was 48% (N=1633). There were 29% female GPs in our study population, mean age was 48 years and 64% and 7% had a completed specialty in general medicine and community medicine, respectively. Compared to the national GP register at the Norwegian Social Science Data Services (NSD), the respondents were representative in terms of age, gender and specialty in occupational medicine, but somewhat overrepresented by GPs with completed specialty in general medicine.

The outcome of interest was GP's own referral routines to specialist health care for OM, in the questionnaire defined as symptoms of either acute otitis media (AOM) or OME. Based on patients' first time visit presenting symptoms compatible with AOM or OME, the GPs were asked to give a rough estimate of the proportion (percentage) of patients that were 1) treated by GP (including expectancy), 2) referred to a practicing otolaryngologist or 3) referred to an ENT department. Next, based on the follow-up visit of the GP treated patients, the participants were asked to estimate the proportion of patients that now were 1) not referred, but treated by GP, 2) referred to a practicing otolaryngologist or 3) referred to an ENT department. Only GPs with consistent answers (; adding up to 100%) were included in the analyses, a total number of 846 observations. Identical questions on referral for hay fever, dizziness and sleep apnea were part of the questionnaire. An OM referral variable was constructed using the answers yielded by GPs on the above two questions. Identical variables were constructed for hay fever, dizziness and sleep apnea.

GPs were dichotomized into 1) early referrers (; refer the majority of patients at first visit) and 2) restrictive GPs (; refer the majority of patients at second visit). Information on the covariates years of GP experience, gender, specialty in general medicine and availability of practising otolaryngologists and hospital services were gathered from the questionnaire. The measures GP workload and availability were based on GPs total number of patients and patient visit vacancies, respectively.

### *Statistical methods*

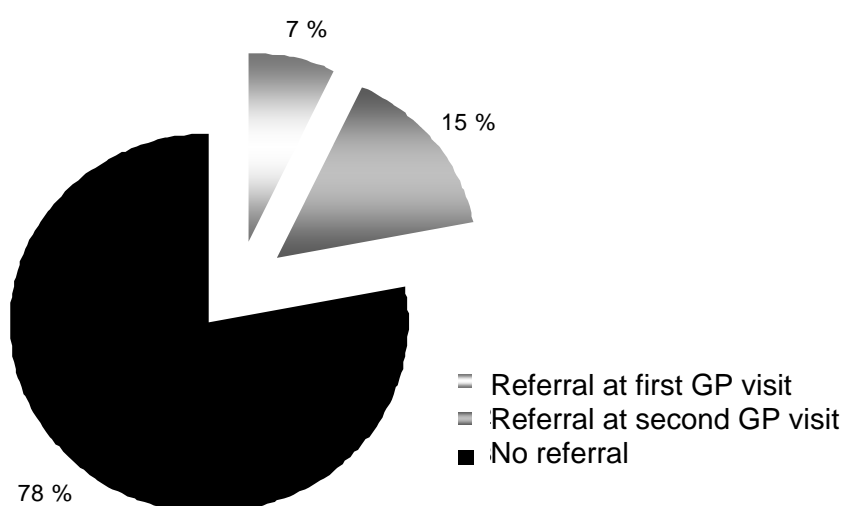
The proportion of patient referrals and variability in referral pattern were estimated. Since the OM referral estimates are based on relative measures (percentages), confidence intervals are not given. Patients referred to specialist care was used as a measure of GP probability for referral. To estimate the influence of GP characteristics and availability of specialist and GP services, linear regression (SPSS 12.0) was applied using the natural logarithmic

transformation of the odds ratio of GP probability for referral. The transformation provides predicted probability coefficients in the interval (0,1). These coefficients serve as the dependent variable in the regression modelling. As a measure of availability to GP and specialist services, a community index that gives the average number of patients of GPs in the community and the mean number of patients on the county GP list and an specialist care index was applied <sup>15</sup>. The estimated regression coefficients in table 2 report the positive and negative association between the dependent variable and GP characteristics and availability measures. Level of significance is given for all statistical significant associations found.

## Results

### *Frequency of GP referrals to specialist health care*

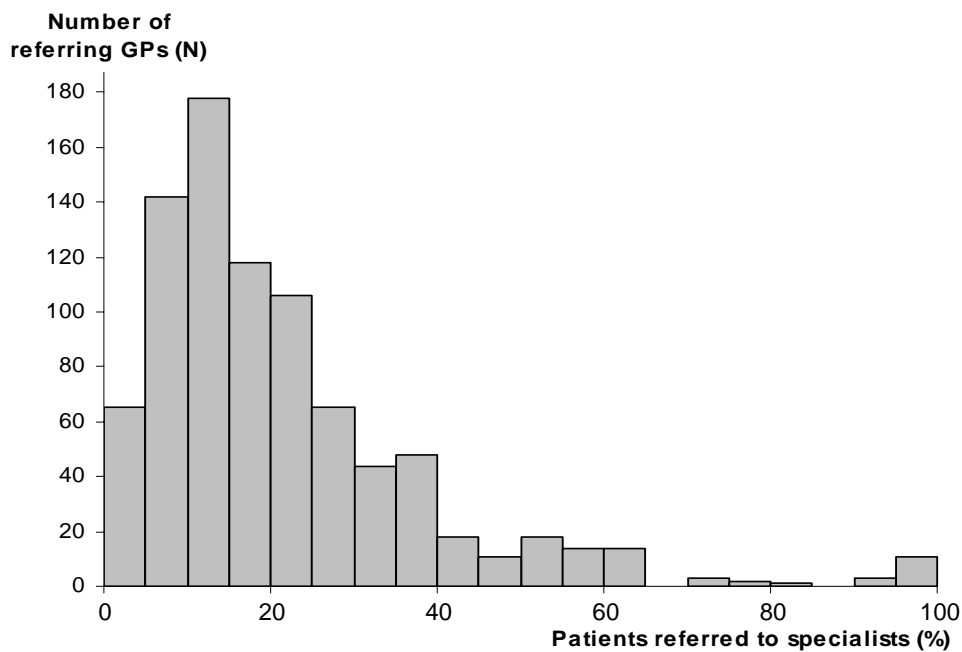
The GPs reported that only 22% of patients presenting symptoms compatible with AOM or OME were referred to otolaryngologists (Figure 1). 7% were referred at first visit and 15% at follow-up. Of all referrals, 27 % of OM patients were sent to an ENT department and 73% to practicing otolaryngologists.



*Figure 1. Distribution of OM referral pattern from GPs to specialist health care. Estimates are based on the description of GPs own referral routines for patients presenting symptoms of AOM or OME at first visit and follow-up, respectively. (N = 846 GPs).*

### *Variation in referral pattern for OM among GPs*

In Figure 2, variation in referrals among GPs is shown. The figure is not normally distributed, but left-shifted towards low number of referrals. This indicates that the majority of GPs refer few patients, confirmed by the 25- and 75- quartiles of 10% and 28%, respectively. When GP referral for OM was compared to referrals for the three other otolaryngologic diseases in the questionnaire, mean referral for hay fever and OM was identical (22%), while sleep apnea and dizziness were more commonly referred (referral rates 66% and 73%, respectively).



*Figure 2. Distribution of variation in referral pattern among GPs. Estimates are based on the description of GPs own referral routines for patients presenting symptoms of AOM or OME at first consultation and follow-up, respectively. (N = 846 GPs).*

### *Factors that influence OM referral*

	Numbers of GPs (N=846)	Proportion of patients referred to otolaryngologist (%)
Time of referral to otolaryngologist		
GP referral at first visit <sup>1</sup>	241	22
GP referral at follow-up <sup>2</sup>	605	21
Specialty in general medicine		
Yes	550	19*
No	296	25

<sup>1</sup> The majority of patients with OM are referred at first visit

<sup>2</sup> The majority of patients with OM are referred at second visit

\* Significant at .01 level

*Table 1. Distribution of referral pattern by GP characteristics; proportion of patients referred at first visit and at follow-up and the impact of GP specialty on referrals. (N=846).*

Time of referral did not affect the rate of children sent to otolaryngologists (Table 1). GPs with specialty in general medicine referred 6% fewer OM patients. Linear regression analysis was applied to study the significance of GP characteristics and availability to health care resources in primary and specialist health care (Table 2).

	Probability for patient referral to either hospital or practicing otolaryngologist		Probability for patient referral to practicing otolaryngologist	
	Coefficient	Standard error	Coefficient	Standard error
Gender (male = reference group)	-.13	.23	-1.75	1.40
Years in general practise	-.02	.01	.09	.07
Specialty in general medicine	-.90	.22**	.51	1.32
Availability of hospital services	.01	.08	-1.22	.48*
Availability of practising otolaryngologists	.05	.06	1.70	.38**
GP work load <sup>1</sup>	.00	.00	.01	.00**
GP availability <sup>2</sup>	-1.44	.96	-2.08	5.74
Constant	-.09	.72	-7.06	4.30
R square		.04		.06

<sup>1</sup> Measure based on estimates of GPs' number of patients

<sup>2</sup> Measure based on estimates of patient visit vacancies

\*\* Significant at .01 level

\* Significant at .05 level

*Table 2. The significance of GP characteristics and availability of health care resources on GP referral. The natural logarithmic transformation of the odds ratio of the dependent variable GP probability for referral is used in the linear regression model.*

After control for gender, total number of years in general practice and availability of health care resources, completed specialty in general medicine was the only measure that significantly reduced the probability for referral to either hospital or practicing otolaryngologists. Except for the latter, no significant associations were found. When separate analysis was performed to study the probability for referral to practicing otolaryngologists, the probability for referral was increased with both GP work load and availability of practicing otolaryngologists in the area. Availability of hospital services was negatively associated with referral to practicing specialists.

## Discussion

We found that OM management mainly takes place in primary care, with referrals most commonly at follow-up visits. GPs with specialty in general medicine refer fewer patients. GP work load, hospital access and availability of practicing otolaryngologists were all determinants for referral.

During the course of AOM or OME, one of five patients needed referral in our study. Referral rates were higher for the otolaryngologic diseases sleep apnea and dizziness than for OM, and 80% of pediatric middle ear infections were treated by GPs alone. The latter is in accordance with the natural course of the disease. Spontaneous resolution of AOM occurs during seven to 14 days in 70% of affected children <sup>1</sup>. Even for OME, there is a high probability of spontaneous resolution <sup>5</sup>. The finding that the majority of patients were referred at follow-up, suggests that GPs to a large extent constitute treatment before the decision on referral is made. This is in accordance with Norwegian recommendations for OM in primary care <sup>4,16,12</sup>; control by GP 8 weeks following the initial episode of AOM and watchful waiting for OME with referral to otolaryngologist if fluid is persistent after 12 weeks observation. Referral to otolaryngologist is also recommended in children with recurrent AOM episodes.

A Dutch study recently reported increased referrals for OME and suggested that patient-related delay in GP consultations could be one explanation <sup>9</sup>. Both physician-related and non-medical factors may contribute to referral variation. <sup>17</sup>. In our study, gender and years of clinical experience did not significantly affect the referral pattern for OM. A striking finding, however, was that GPs with specialty in general medicine had significantly lower referral rates. Most GPs are familiar with the symptomatology, course and severity of the OM disease continuum, but decision criteria for watchful waiting versus referral are unclear <sup>18</sup>. Accordingly, both GP experience and knowledge is required to decide the timing when specialist referral is warranted. Norwegian guidelines for OM treatment and referrals in primary care are non-specific, and include recommendations for both the use of antibiotics, follow-up by GPs and indications for referral to specialist care <sup>12,16</sup>.

Clinicians need simple, specific and user friendly guidelines. One key component is the presentation of evidence and recommendations in an accessible format <sup>19</sup>. Whether passive dissemination of referral guidelines leads to change in referral behaviour has been questioned <sup>18,20</sup>. In Norway, specialists in general medicine have continuous education both to achieve and renew their specialty, the latter required every fifth year <sup>14</sup>. The (re)certification training



involves compulsory courses, GP practice visits and collegial learning groups as well as a combination of optional activities. Such learning aims at doctor's performance as the target to facilitate learning and change <sup>21</sup>. We suggest that learning groups in primary care, with clinical discussions including guideline implementation, may contribute to update knowledge and fewer referrals to specialist care <sup>22</sup>. Further, increased knowledge may contribute to a higher level of physician autonomy in treatment and follow-up of patients. Our finding is in accordance with Treweek suggesting that effective implementation strategies for GPs is important for guidelines to be used <sup>11</sup>.

Non-medical factors may significantly influence efficiency of guidelines in general practice. In our study, GP work load, hospital access and availability of practicing otolaryngologists were all determinants for referral. Norway has publicly financed health care, and services are available on equal financial terms for all citizens <sup>23</sup>. Accordingly, similarity in access to health care services should contribute to a uniform referral pattern for pediatric OM. There is a geographic distribution of hospital services towards urban areas, leaving a national difference in proximity to ENT departments. Also, hospital services have shown insufficient ability to absorb patient inflow resulting in waiting times, especially for ENT services, thus contributing to reduced accessibility to specialist care. Surgery is mainly provided by hospitals, and practising otolaryngologists seem to act as an intermediate between hospitals and GPs, often responsible for the surveillance of children with OM in the watch-and-wait period and for the follow-up after surgical intervention. Our data suggest a small, but significant increase in referral rate to practicing otolaryngologists when GP work load is high. Availability to hospital services seems to reduce the need for referral to practicing specialists.

### *Validity*

Our GP self-reports on referral rates are higher than the postulated referral in a recent Dutch study <sup>9</sup>. In Norway, GPs act as gatekeepers for their patients, and separate clinics take care of the majority of emergency consultations, where AOM is common <sup>24</sup>. Only few emergency OM consultations will therefore appear on the GP's regular list of patients. Also, while the Dutch study report calculates referrals from consultation rates, our estimates are based on the course of OM.

The present study does not yield quantitative information on referral rates for childhood OM, and the questions GPs received on OM did not distinguish between AOM and OME since we

intended to study the GP's perspective on OM referral. Accordingly, the data cannot be used for quantitative measurements of childhood referral, but yield useful information about the role of GPs in management of childhood OM. As otolaryngologists, we tend to see the patients presented to us as representative of the population in general, and this is likely to influence our view on severity of otolaryngologic disorders. Although the age, gender and occupational specialty distribution of GPs were equal to those of Norwegian GPs, there are limitations to our data in terms of generalizability of the study results due to somewhat low response rate.

## Conclusion

In Norway, OM management mainly takes place in primary care. Completed specialty in general medicine reduces referrals. We suggest that learning groups may contribute to update knowledge in primary care and fewer referrals to specialists. Also, non-medical factors seem to influence referral behavior in general practice.

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